



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/575,320

01/24/2007

David J. Lark

6111.001-01

3622

46251

7590

02/05/2009

T. D. FOSTER

12760 HIGH BLUFF DRIVE, SUITE 300

SAN DIEGO, CA 92130

EXAMINER

BELYAEV, YANA

ART UNIT

PAPER NUMBER

4122

MAIL DATE

DELIVERY MODE

02/05/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/575,320	Applicant(s) LARK ET AL.	
	Examiner YANA BELYAEV	Art Unit 4122	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 April 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 30-55 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 30-55 is/are rejected.
- 7) ☒ Claim(s) 30-55 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|----------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>1/10/2008</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 30-55 objected to because of the following informalities: The dependency of the claims referenced within the application is incorrect. For examination purposes the examiner will correlate the dependency based on the original claim dependency. For example, any claim within the application referencing claim 1 is assumed to refer to claim 30, referencing claim 2 is assumed to refer to claim 31, referencing claim 3 is assumed to refer to claim 32, and so forth. Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 4122

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims 30-55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ben Zvi et al (EP 0638404) in view of Beretta (EP 0914933); Okamura et al (US Patent Publication 2004/0092612); Hodgson (WO 02/42041).

6. With respect to claims 30-32 and 37-38 Ben Zvi discloses a method for producing plastic products from waste materials. The method comprises reducing plastic material to form plastic particles having a desired particle size (Ben Zvi et al, page 2, lines 10-12); providing a susceptor agent selected from a particles of inorganic material having a high absorbance of radio frequency radiation, including aluminum silicate (Ben Zvi et al, page 3, lines 34-35); providing a bonding agent to the plastic particles, for example a liquid material which polymerizes when heated to bond the plastic pieces together (Ben Zvi et al, page 3, lines 47-48); and treating the plastic particles with electromagnetic waves with radio-frequency energy to form a

Art Unit: 4122

useable plastic material (Ben Zvi et al, page 2, lines 13-15). Ben Zvi et al. further teaches mixing wasted plastic material (page 2, lines 12-13) and producing a solid product (page 2, line 31-34).

7. Ben Zvi et al. does not specifically disclose treating the plastic particles with microwave energy to form a useable plastic material.

However, Beretta discloses that plastics which are classified as dielectric materials, such as PET and POM, have in previous applications been successfully dielectrically heated by means of electromagnetic waves specifically radio frequency waves or microwaves (Beretta et al, column 2, paragraph 22). Furthermore, Beretta discloses that heating by either radio frequencies or microwave frequencies are able to heat a plastic product uniformly and simultaneously in all the layers of its mass (Beretta et al, page 3, paragraph 28). Beretta discloses that the advantages of using either microwave radiation or radio frequency radiation to heat by dielectric loss is particularly evident in the case of semi-finished components having considerable thickness variations. Uniform heating prevents molecular orientation from occurring first in the thinner regions and then advancing towards the thicker ones and instead allows it to occur simultaneously in all regions (Beretta et al, page 4, paragraphs 50-51). Therefore, the substitution of radio frequency radiation in Ben Zvi's invention with microwave radiation would have been obvious to one of ordinary skill in the

Art Unit: 4122

art at the time the invention was made as microwave radiation would have been and obvious substitution in Ben Zvi, thus obtaining the advantages disclosed by Barreta.

8. Furthermore, Ben Zvi does not specificity a susceptor agent selected from the group of possible susceptor agents listed in claim 30.

However, Beretta discloses that to achieve heating by dielectric loss in a wide range of plastics it is necessary to add additives capable of increasing the loss factor to a value of at least 0.01. Carbon black or graphite, added in a percentage between 3% and 20%, were found to be ideal in for the purpose of achieving a degree of absorption of energy carried by magnetic waves at radio and microwave frequencies (Beretta, column 4, lines 35-57). In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a *prima facie* case of obviousness exists (see MPEP § 2131.03). For reference, *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990) (The prior art taught carbon monoxide concentrations of "about 1-5%" while the claim was limited to "more than 5%." The court held that "about 1-5%" allowed for concentrations slightly above 5% thus the ranges overlapped.) Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Ben Zvi's invention in view of Beretta and use carbon black as an agent in order to impart a degree of

Art Unit: 4122

absorption of energy from either radio or microwave frequencies to the plastic particles.

9. With respect to claims 39-40, Beretta discloses that carbon black or graphite, added in a percentage between 3% and 20%, were found to be ideal (Beretta, column 4, paragraph 35-38). Differences in concentration or temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical (see MPEP § 2144.05). For reference, *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955) “[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.” Therefore it would have been obvious to one of ordinary skill in the art at the time of application to modify Ben Zvi’s to include the concentration of Carbon Black as an additive as taught by Beretta in order to aid in the heating of the plastics of Ben Zvi et al.

10. With respect to claim 33-36, Ben Zvi discloses cutting a mixture of plastic materials including rigid polyvinyl chloride, polyethylene, polystyrene, and/or polycarbonate wastes into pieces such that the bulk of the pieces are within the range of 2-10 mm (Ben Zvi et al, page 3, lines 19-21). In the case where the claimed ranges “overlap or lie inside ranges disclosed by the prior art” a *prima facie* case of obviousness exists (see MPEP § 2131.03). For

Art Unit: 4122

reference, *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990)

(The prior art taught carbon monoxide concentrations of "about 1-5%" while the claim was limited to "more than 5%." The court held that "about 1-5%" allowed for concentrations slightly above 5% thus the ranges overlapped.)

Therefore, it would have been obvious to one of ordinary skill in the art to cut or shred the pieces of plastic in order for the pieces to have a high absorbance of RF radiation.

11. With respect to claims 53-54, Ben Zvi discloses that the heater should be capable of heating the plastic pieces by dielectric heating to a temperature of 100 to 200 degrees Celsius to soften their outer surfaces (Ben Zvi et al, page 3, lines 22-23). In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a *prima facie* case of obviousness exists (see MPEP § 2131.03). It would have been obvious to one of ordinary skill in the art to heat the plastic particles to the temperature taught by Ben Zvi et al. in order to soften the surfaces of the particles.

12. With respect to claim 55, Hodgson discloses that an alternative to the suggested configuration is to incorporate the static mixing unit (figure 19) and thus the mixing of the materials in the conduits (figures 16a and 16b) within the microwave applicator (figure 17) to ensure the component materials contained in the tanks are mixed at the correct temperature (Hodgson, page 19, lines 4-7). Therefore it would have been obvious to one

Art Unit: 4122

of ordinary skill in the art at the time the invention was made to modify Ben Zvi's invention with the mixer of Hodgson to ensure the component materials are mixed at the correct temperature.

13. With respect to claim 52, Okamura discloses that in order to prevent burning, silver streak, forming, sink mark and short shot, which suddenly occurs at molding the resins used for the mold plastic parts are heated or disposed in vacuum space (Okamura et al, page 20, paragraph 19).

Therefore it would have been obvious to one of ordinary skill in the art at the time of application to modify Ben Zvi's invention in view of Okamura to include a vacuum during the process in order to prevent burning, silver streak, forming, sink mark and short shot.

14. With respect to claim 45, Ben Zvi discloses that plastic materials may be a mixture including rigid polyvinyl chloride, polyethylene, polystyrene, and/or polycarbonate wastes (Ben Zvi et al, page 3, lines 19-21).

15. With respect to claim 46, Okamura discloses that possible solvents include cyclohexane and ketones (Okamura et al, page 11, paragraph 213 – 214). The reference further states that antioxidants, including phenol-based antioxidants and ketone amine condensate-based antioxidants, prevent the deterioration of heat of the thermoplastic resin and the heat decomposition of each of the additives (Okamura et al, page 11, paragraph 207).

Therefore, it would have been obvious to one of ordinary skill in the art at

Art Unit: 4122

the time of application to modify Ben Zvi's invention in view of Okamura to include solvents such as cyclohexane and ketones in order to prevent the deterioration of heat of the thermoplastic resin and the heat decomposition of each of the additives.

16. With respect to claim 50, changes in sequences of adding ingredients are not patentable (see MPEP 2144.01). Providing the susceptor agent and then providing the bonding agent or providing the susceptor agent at the same time as the bonding agent is not patentable in the absence of new or unexpected results. For reference, *In re Burhans*, 154 F.2d 690, 69 USPQ 330 (CCPA 1946) (selection of any order of performing process steps is *prima facie* obvious in the absence of new or unexpected results).

17. With respect to claim 51, Okamura discloses that the thermoplastic resin compounds may be also colored by adding the coloring light-shielding material so as to be semitransparent or non-transparent. Thus, the light-shielding ability and rigidity becomes higher, and the mold plastic part have better appearance, and failure of coloring and acne becomes less prominent. Examples of the coloring material include a dye, color pigment, white pigment, metal powder, metal fiber, metal flake, carbon black, and the like (Okamura et al, page 9, paragraph 161). Therefore, it would have been obvious to one of ordinary skill in the art at the time of application to modify

Ben Zvi's invention in view of Okamura to include coloring compounds in order to increase the light shielding ability, rigidity, and the appearance.

18. With respect to claims 47-49, Hodgson discloses preferably the composite board contains between 5% and 20% by weight binder (Hodgson, page 8, lines 18-19). Therefore, it would have been obvious to one of ordinary skill in the art at the time of application to modify Ben Zvi's invention in view of Hodgson to apply the same preferred range of bonding agent to Ben Zvi's invention in order to provide bonding to the particles.

19. With respect to claim 44, Hodgson discloses that to produce final reconstituted products of different strengths other additives may be added, including acetone, acetic acid, aniline, butyl acetate, hydrogen peroxide or toluene (Hodgson, page 25, lines 4-9). Ben Zvi suggests using polystyrene (Ben Zvi et al, page 3, line 20). Therefore, it would have been obvious to one of ordinary skill in the art at the time of application to modify Ben Zvi's invention in view of Hodgson to add other additives including acetone or toluene in order to produce final products of varying strengths.

20. With respect to claims 41-43, Okamura discloses that the content of materials which are added to the mold plastic, including phenol-based solvents such as dihydroxydiphenylcyclohexane is 0.001-1.0 wt %, preferably 0.005-0.7 wt. %, particularly 0.01-0.45 wt. %, especially 0.02-0.3 wt. % (Okamura et al, page 11, paragraph 210). In order to compare

the weight percentages disclosed by Okamura with the ratios for forming the bonding agent stated in the claim, it is necessary to convert the ratios for forming the bonding agent in the claim to weight percentages. From Examples 1-3 in the Specification (page 11 -16) the ratios are determined to be weight percentage ratios for forming the bonding agent. Therefore, the solvent weight percentage in claim 42 is 57 wt. % to 29 wt. % and the solvent weight percentage in claim 43 is 50 wt. %. However, Okamura discloses the solvent weight percentage with respect to the total plastic weight, not just the solvent weight percent in the bonding agent. The Specification (page 4) states that the bonding agent is added to the plastic particles in a proportion of about 1% to 30% (w/w). Therefore, the final step is converting from the solvent weight percentage in the bonding agent to the weight percentage of solvent with respect to total plastic weight. This calculates to 0.57 wt. % to 15 wt. % of solvent with respect for total plastic weight. Now it is possible to compare the claims with Okamura and the weight percentage stated in the claims overlaps with the range disclosed by Okamura. Therefore, it would have been obvious at the time of the invention for one of ordinary skill in the art to optimize the weight percentage ratios disclosed by Okamura and discover the optimum or workable ranges by routine experimentation. Differences in concentration or temperature will not support the patentability of subject matter encompassed by the prior art

Art Unit: 4122

unless there is evidence indicating such concentration or temperature is critical (see MPEP § 2144.05). See *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to YANA BELYAEV whose telephone number is (571)270-7662. The examiner can normally be reached on M-Th 8:30 am - 6 pm; F 8:30 am- 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Milton Cano can be reached on 571-272-1398. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 4122

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Y. B./
Examiner, Art Unit 4122

/Milton I. Cano/
Supervisory Patent Examiner, Art Unit 4122